# CHENBRO

# CK22803

## SAS Expander
## 6 Gb/s 28 Ports

## User's Manual

## Ver. 1.0

**Sep / 10 / 2012**



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# Technical Support

**Chenbro works hard to offer our customers maximum performance from our chassis. But in case you have any problem with our product you can find supports from the following resources.**

## Web Support

Detail information of our products is in our website. You can find technical updates, installation guides, FAQs, technical specifications and more. Our web address is: www.chenbro.com.

## Email Support

You can also fill out the technical support form at our Technical Support page. You technical issue inquiries will be sent directly to our support professionals.

## Phone Support

**You can also contact Chenbro HQ or branch office for immediate support; contact Information is as following:**

Chenbro HQ
Tel: 886-2-8226-5500
Fax: 886-2-8226-5423

Chenbro Europe B.V.
Tel: 31-40-295-2045
Fax: 31-40-295-2044

Chenbro Micom (USA) Inc.
Tel: 1-909-947-3200
Fax : 1-909-947-4300

Chenbro UK LTD
Tel: 44-(0)161-425-5341

Chenbro China Office
Tel: 86 010-6709-1786
Fax: 86 010-6709-1786

## Contents

## *Revision History*

| Date | Modifications |
|---|---|
| Sep / 10 / 2012 | ● First release (V1.0) |

## *Safety Information*

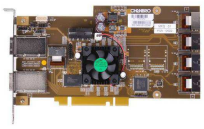
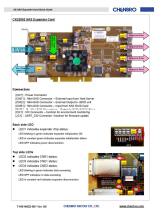
- **Read the installation instructions before connecting to the power source.**
- **Only trained and qualified personnel should be allowed to install, replace or service this equipment.**
- **Never install this product in a wet environment.**
- **Position system cables and power cables carefully; route system cable and the power cable and plug so that they cannot be stepped on or tripped over. Be sure that nothing rests on your system component cables or power cable.**

# *Getting Start with SAS (Serial Attached SCSI) Expander Card*

**Thanks for purchasing CHENBRO SAS Expander Card! This section covers unpacking and identifying components.**

## *Unpacking and Checking the Contents*

**The complete package includes the following items:**

| Item Description | Quantity | Picture |
|---|---|---|
| **Standard SAS Expander Card (**80H10462202A0**)** | **1** |  |
| **Mini-SAS Cable, 350mm (**26H11321528B0**)** | **1** |  |
| **Quick Guide (**71H014622-001**)** | **1** |  |
| **D-SUB Cable, 9P-4P, 200MM (**26H11462201A0**)** | **1** |  |

**Remarks: P/N are subjected to be changed by version upgrade**

## *Technical Specifications*

| | |
|---|---|
| **Mini-SAS Ports** | **Internal Input from SAS RAID Card：4-port (1x Mini-SAS)**<br>**Internal Output to Backplane：16-port (4x Mini-SAS)**<br>**External Input from Host：4-port (1x Mini-SAS)**<br>**External Output to Storage Center：4-port (1x Mini-SAS)** |
| **Number of Supported SAS / SATA in directly connection of HDD** | **16 HDDs (Internal connection)** |
| **Mechanical Dimension** | **195 mm x 107 mm** |
| **Power Connector** | **4-Pin Connector** |
| **Power Consumption** | **12 Watts** |
| **Operating Temperature** | **0~50 ℃ (32~122 ℉)** |
| **Relative Humidity** | **20%~90%, non-condensing** |

## *Features*

### *General*

- **Flexible application of 28-port Standard SAS Expander Card**
- **Support HDD Failure / Activity Indication and HDD ID Mapping**
- **Mechanical fitting compatible with motherboard PCI-Express 4X, 8X, 16X & PCI slots**

### *High-Speed I/O*

- **6.0 Gbit/s or 3.0 Gbit/s operations**
- **Automatic negotiation of linking speed**

### *Application*

- **SAS / SATA HDD NAS storage sever or enclosure**
- **Security system / data storage**
- **CAD/CAM engineering / scientific modeling**
- **Video streaming / editing workstation**

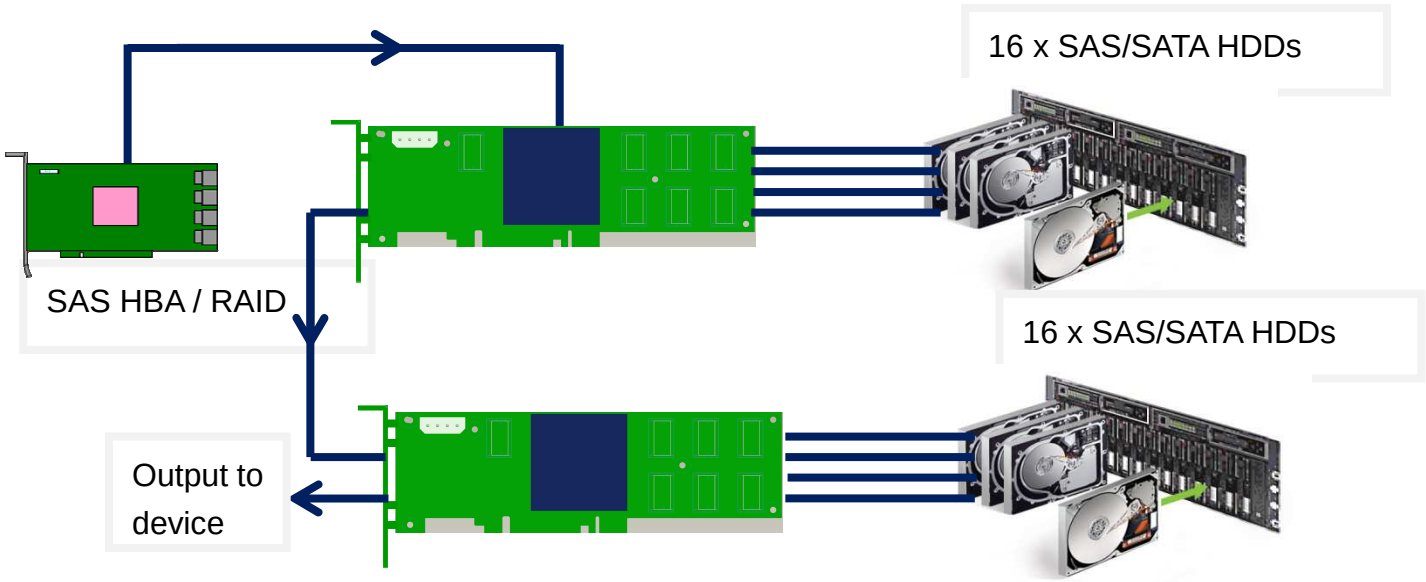
# Introduction

## About this Guide

**The SAS expander card user's manual provides the information for functions, capabilities, configuring and maintaining the RAID arrays hosted by the expander card.**

## Introducing the SAS Expander Card

**SAS expander card expands one SAS address to a number of additional ports. It is an optimal device for usage in data centers**

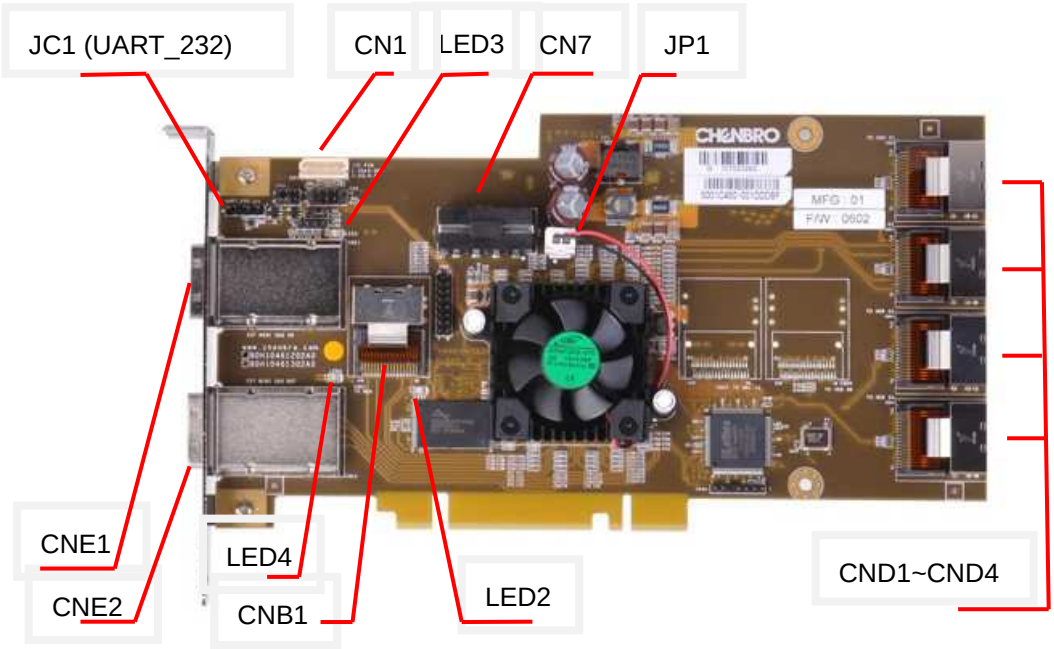



**The CHENBRO 28-port Standard SAS expander card provides high performance, high disk drive connectivity, scalability and flexibility in various storage environments. It is a valuable solution to other expansive and complex topologies. The SAS expander is ideal for high availability, scalable server clustering environments, front-end storage subsystems used in clusters, SANs and NAS environments.**

**The CHENBRO SAS Expander is based on LSI SASIIX28 IC that enables the connection of multiple drive devices in directly attached SAS or SATA. Each expander PHY performs SAS and SATA transfer rate at 6.0 Gbit/s or 3.0 Gbit/s with individual configurations. The SAS expander IC supports the Serial SCSI Protocol (SSP), SATA Tunneled Protocol (STP) and Serial Management Protocol (SMP). Those are based on SAS protocol and described in the SAS standard v1.0, V1.1 and V2.0.**

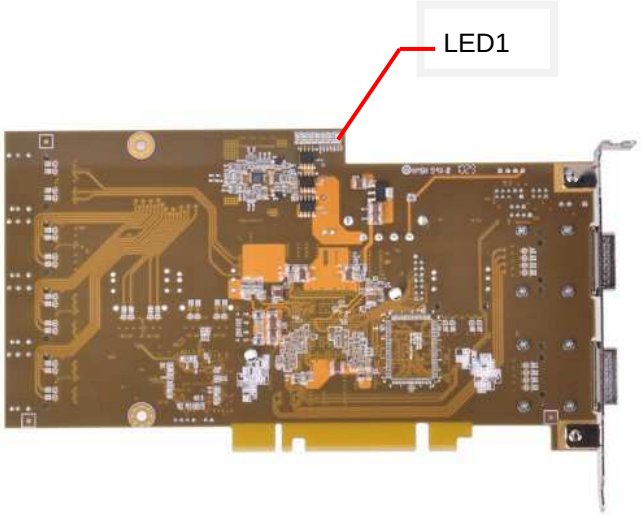
# SAS Expander Card Hardware

## SAS Expander Card Layout

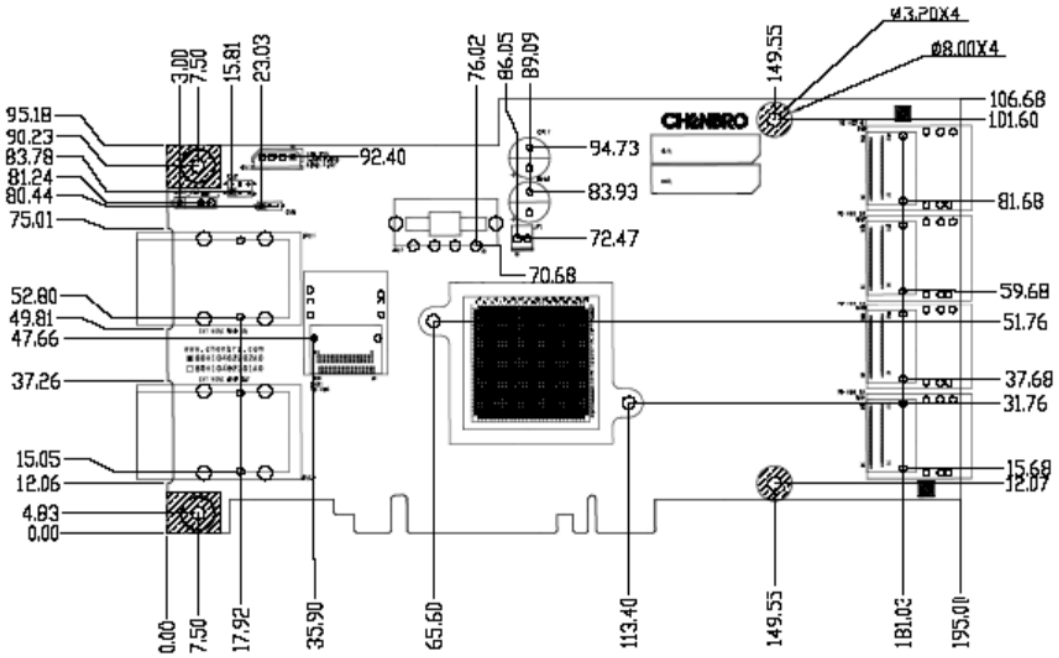



| Components | Description | Function |
|---|---|---|
| CNB1 | Mini-SAS SFF-8087 Connector – Internal Input | Internal input from SAS RAID Card |
| CND1~CND4 | Mini-SAS SFF-8087 Connector – Internal Output | Internal output to SAS / SATA HDDs (See Appendix 1 about pin assignment) |
| LED1 | SAS Expander Status LED | Green LED blinking indicates SAS Expander works / ready |
| LED2 | Internal Input (CNB1) Status LED | Green LED blinking indicates internal input link activity; Red LED indicates no signal connection No LED indication while no activity (under signal connection) |
| LED3 | External Input (CNE1) Status LED | Green LED blinking indicates internal input link activity; Red LED indicates no signal connection No LED indication while no activity (under signal connection) |

| | | |
|---|---|---|
| LED4 | External Input (CNE2) Status LED | Green LED blinking indicates internal input link activity;<br>Red LED indicates no signal connection<br>No LED indication while no activity (under signal connection) |
| JP1 | Fan Power Connector | DC in, 2-Pin, +12V from Power Supplier |
| JC1 | UART RS232 connector | Command Line Interface (CLI)<br>Console port for firmware upgrade<br>Baud Rate: 115,200 - 8 data bit - 1 stop bit<br>(See Appendix 2 about the firmware update procedure) |
| CN1 | IIC Connector | Factory reserved |
| CN2 | Default Setting | Default Setting Jumper |
| CN3 | Debug Connector | Factory reserved |
| CN4 | Test Connector | Factory reserved |
| CN5 | SGPIO Connector | Factory reserved |
| CN6 | Test Connector | Factory reserved |
| CN7 | Power Connector | DC in, 4-Pin, +5V/+12V from Power Supplier |
| CN8 | Default Setting | Default Setting Jumper |



## Mechanical Dimension




# Mini-SAS Cables Option

**The Mini-SAS backplane provides most benefits to users using the same backplane to support various SAS/SATA RAID card via different conversion cables. Chenbro provides various cables for different interfaces which include the followings:**

**(A) mini SAS SFF-8087 to mini SAS SFF-8087**

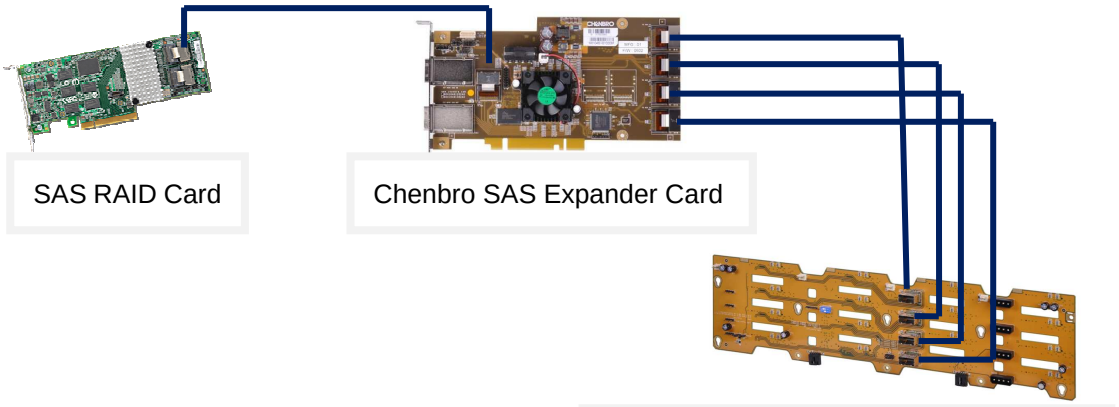
**(B) mini SAS SFF-8087 to 4 SATA**

| Connector | | P/N | Cable Length | Remarks |
|---|---|---|---|---|
| Host (RAID card) | Backplane | | | |
| Mini-SAS (SFF-8087 36 pin) | Mini-SAS (SFF-8087 36 pin) | 26H11321528B0 | 350 mm | In package |
| Mini-SAS (SFF-8087 36 pin) | Mini-SAS (SFF-8087 36 pin) | 26H113215-030 | 600 mm | |
| Mini-SAS (SFF-8087 36 pin) | SATA x 4 ports (7 pin) | 26H12323601A0 | 600 mm | |

# Chassis Assembly Example

***See below for the example of how the wiring to be performed.***

## *Example for RM31616 chassis Mini-SAS backplane wiring*



# *Compatible SAS RAID Cards*

**CK22803 Firmware Version 0703; MFG configuration version 01 ; Hardware Version A0**

| Brand | Model No. | Firmware | Device protocol | Ports | Internal connector | External connector | Validation result | SES message display at RADI card UI |
|---|---|---|---|---|---|---|---|---|
| LSI | MegaRAID 9266-8i | 23.4.1-0028 | 6Gb/S | 8 | 2 | - | OK | V |
| LSI | MegaRAID 9261-8i | 12.7.0-0007 | 6Gb/S | 8 | 2 | - | OK | V |
| LSI | MegaRAID 9260-8i | 2.120.33-1197 | 6Gb/S | 8 | 2 | - | OK | V |
| LSI | MegaRAID SAS 9260-4i | 2.70.03-0862 | 6Gb/S | 4 | 1 | - | OK | V |
| LSI | MegaRAID SAS 9280-24i4e | FH9X 5.08.00.008 | 6Gb/S | 28 | 6 | 1 | OK | V |
| LSI 3Ware | SAS 9750-4i | FH9X 5.08.00.008 | 6Gb/S | 4 | 1 | - | OK | V |
| LSI 3Ware | SAS 9750-8i | FH9X 5.08.00.008 | 6Gb/S | 8 | 2 | - | OK | V |
| Areca | ARC-1880-ix-242 | V1.48A | 6Gb/S | 28 | 6 | 1 | OK | V |
| Areca | ARC-1880ixl-8 | V1.48A | 6Gb/S | 12 | 2 | 1 | OK | V |
| Adaptec | RAID 6805 | b18276 | 6Gb/S | 8 | 2 | - | Tested by 3rd party | X |

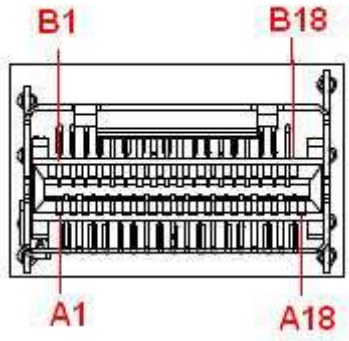
**SES: SCSI Enclosure Services**

# *Appendix 1*

## SFF-8087 Pin Assignment

**MINI SAS CONNECTOR (FOR HBA)(CNB1)**
**MINI SAS CONNECTOR (FOR HDD)(CND1-CND6)**

Front View




| PIN NUMBER | Signal | PIN NUMBER | Signal |
|---|---|---|---|
| A1 | GND | B1 | GND |
| A2 | RP1 | B2 | TP1 |
| A3 | RN1 | B3 | TN1 |
| A4 | GND | B4 | GND |
| A5 | RP2 | B5 | TP2 |
| A6 | RN2 | B6 | TN2 |
| A7 | GND | B7 | GND |
| A8 | NC | B8 | NC |
| A9 | NC | B9 | NC |
| A10 | NC | B10 | NC |
| A11 | NC | B11 | NC |
| A12 | GND | B12 | GND |
| A13 | RP3 | B13 | TP3 |

# Appendix 2

- **Firmware update environment setting**

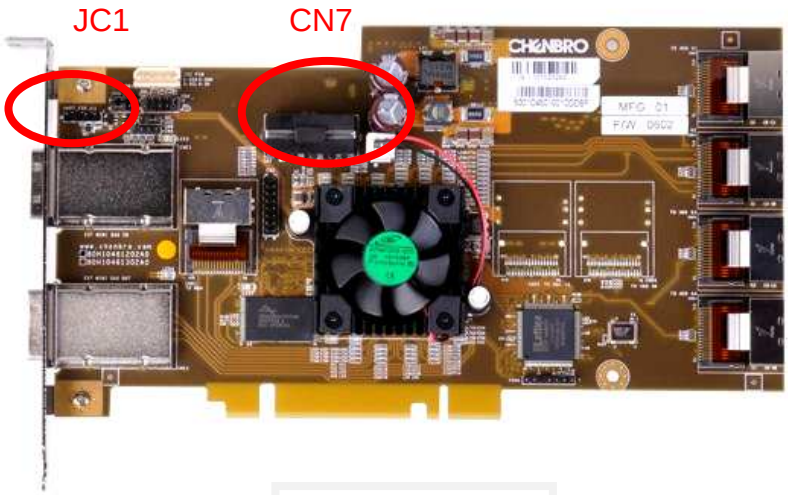



Photo 1-1

Step1: Plug firmware upgrade cable to **JC1**

Setpe2: Plug Big 4-Pin Power cable **to CN7**.

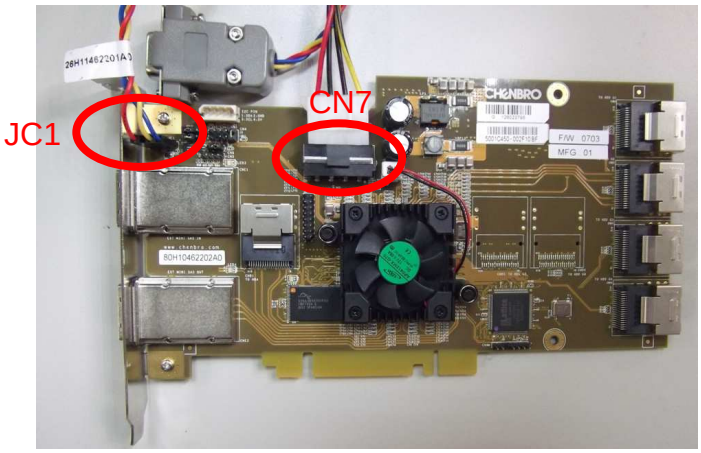
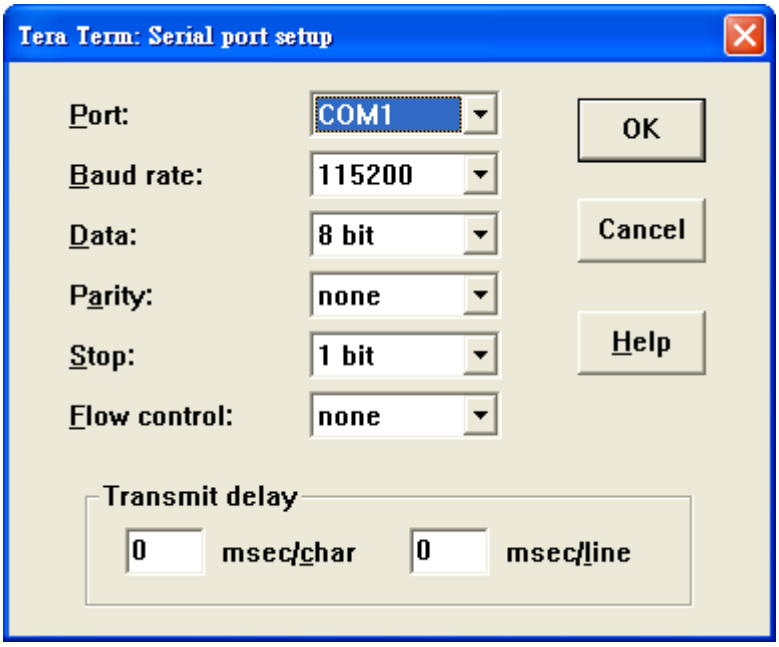



Photo 1-2

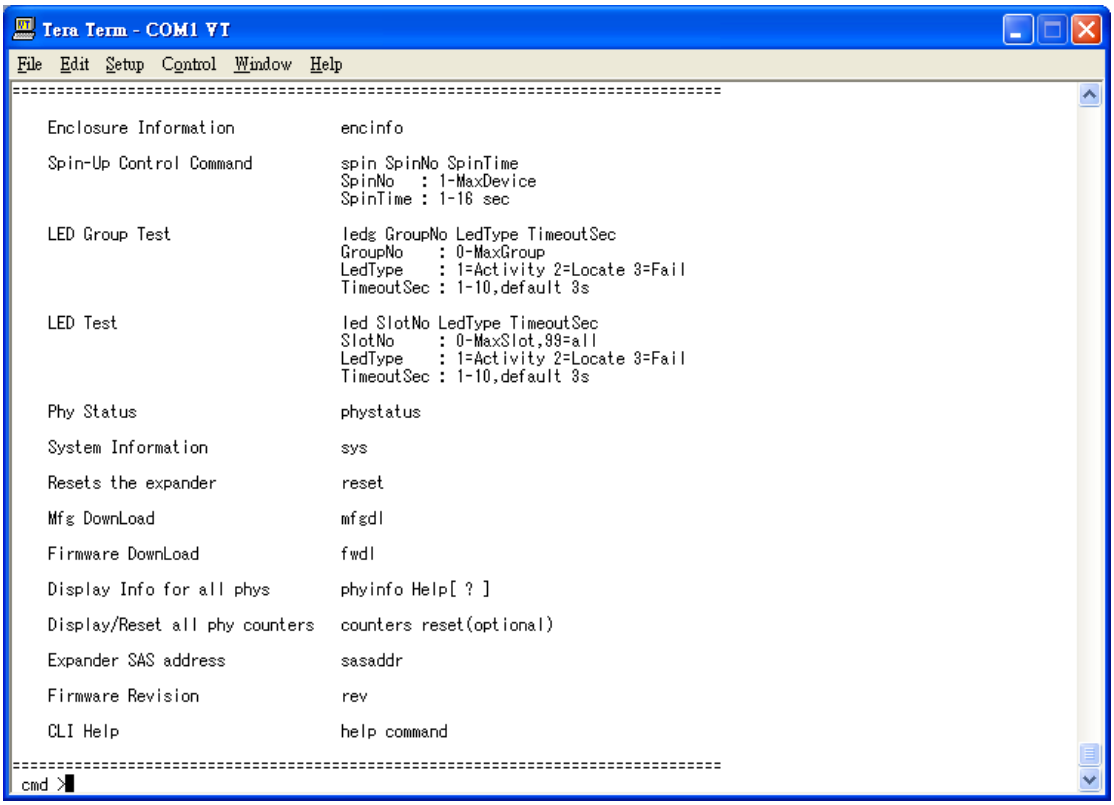
STEP3: Open terminal software (ex. Hyper terminal)

STEP4: Set baud rate and serial port (Please refer photo 1-1)




STEP5: Power on expander card or expander BP

STEP6: Check connection state

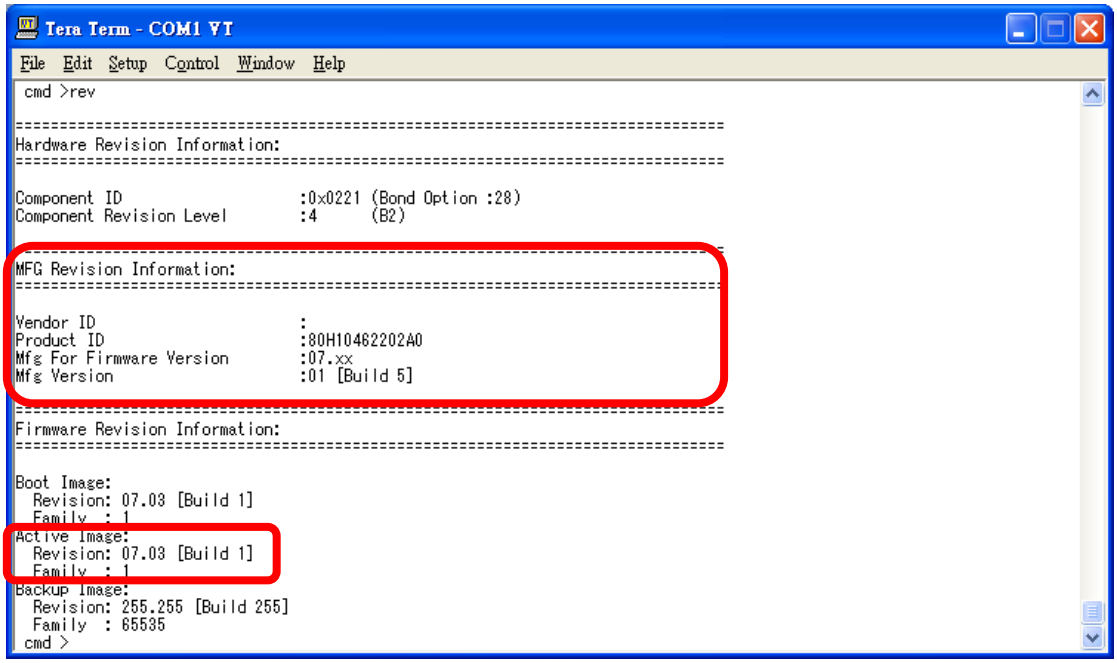


- **How to verify firmware revision information**

STEP1: Use "**rev**" command to get firmware information from expander card or expander Backplane.

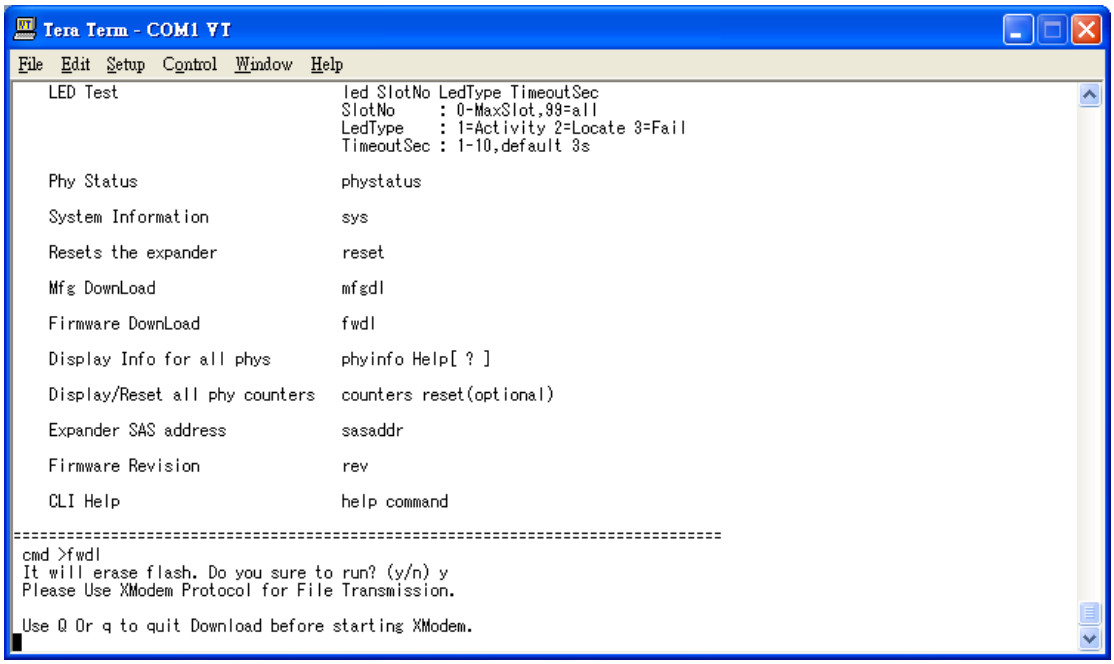
STEP2: Firmware revision information

Firmware revision was combined by revision of **MFG image** (MFG Configuration Version) and **active image** (Firmware Version).

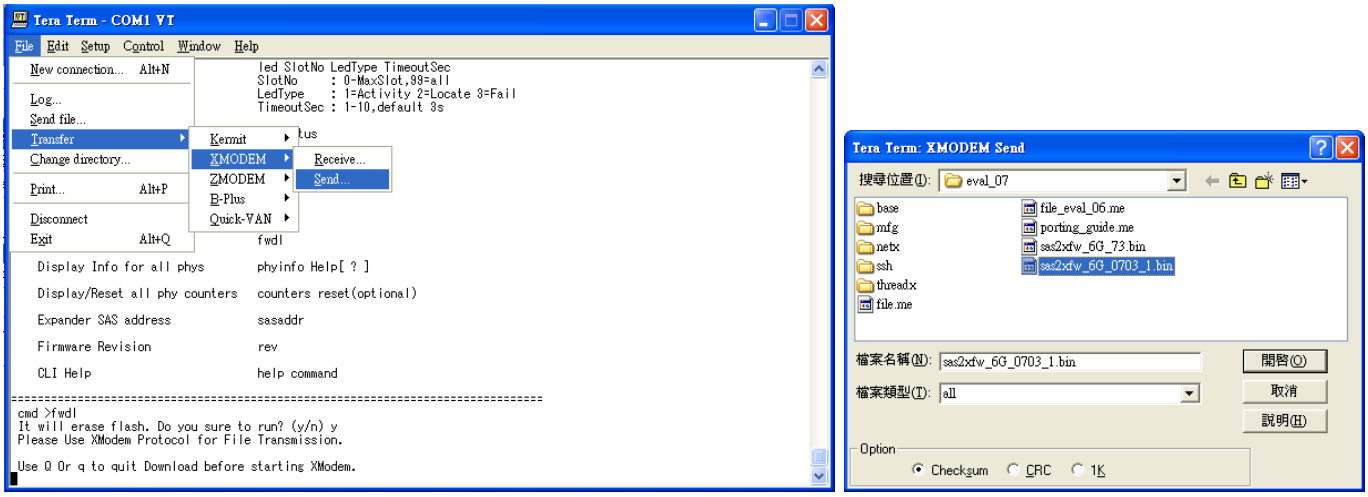


- **How to upgrade Firmware-Active Image**

STEP1: Use command (**"fwdl" and "y"**)



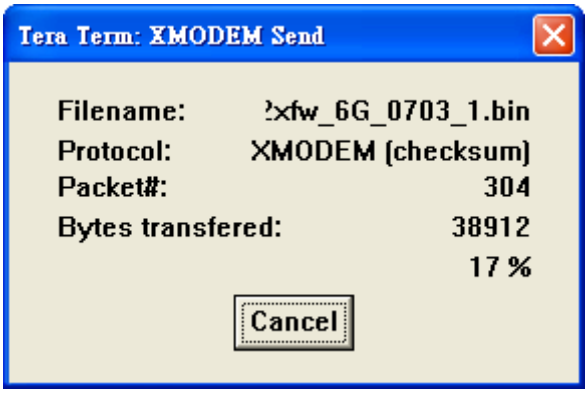

STEP2: Please use transfer mode as "XMODEM", selection firmware code "*.bin"



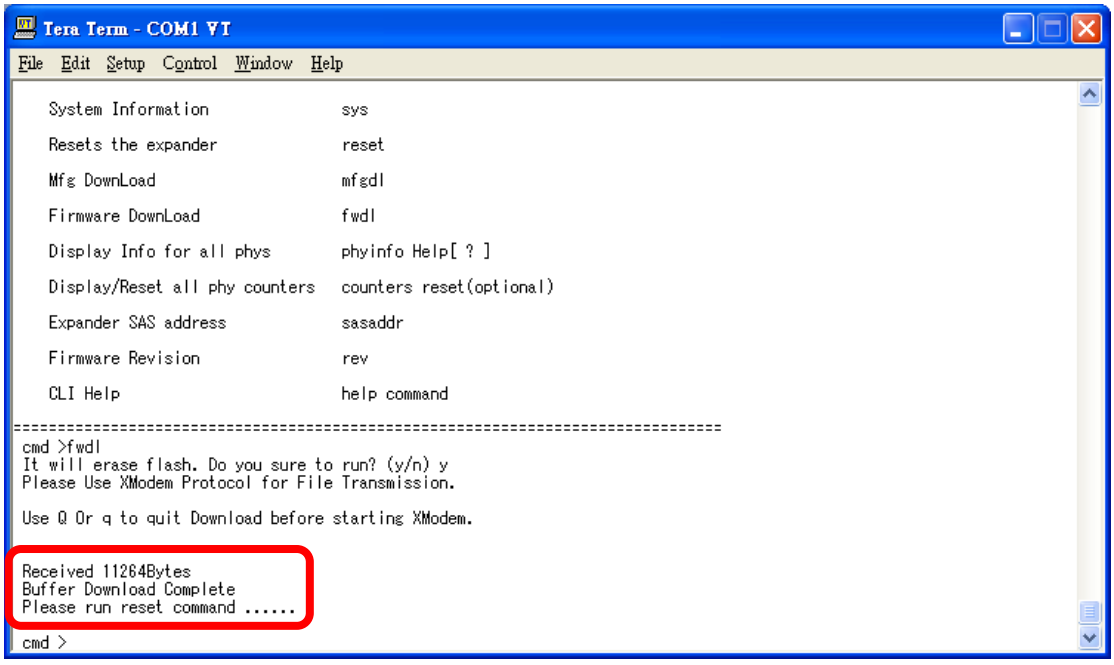

Example: download sas2xfw_6G_0703_1.bin

Please verify your SAS expander model & P/N, suitable hardware/software revision should be matched.

STEP3: Send file process status

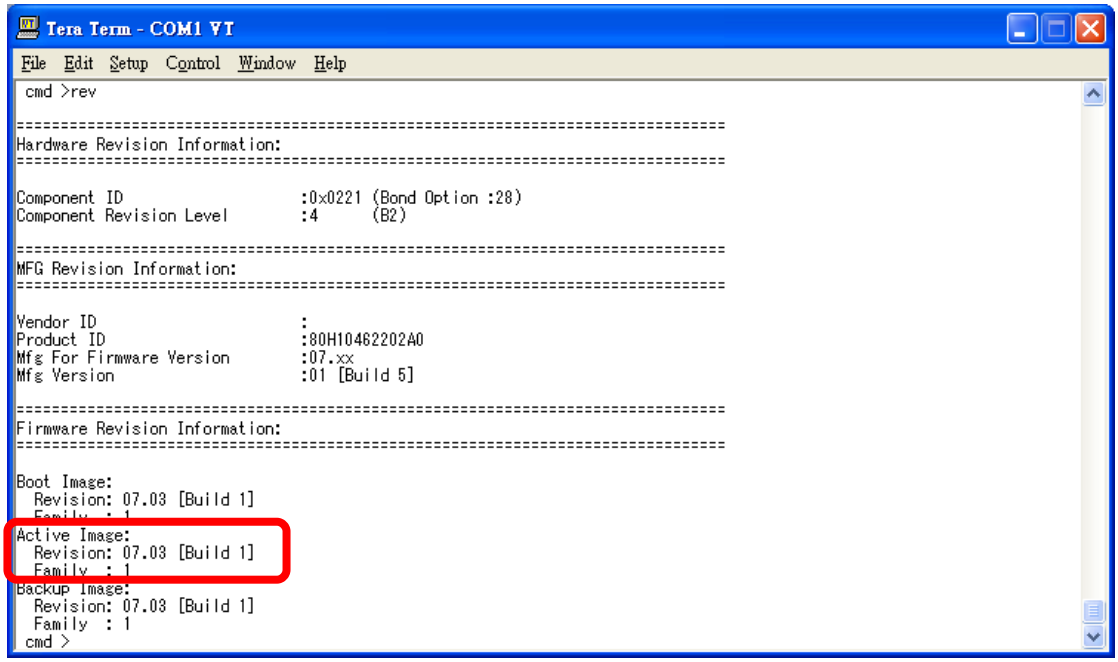



STEP4: Download firmware file complete.



STEP5: Please use "**reset**" command reset expander system.

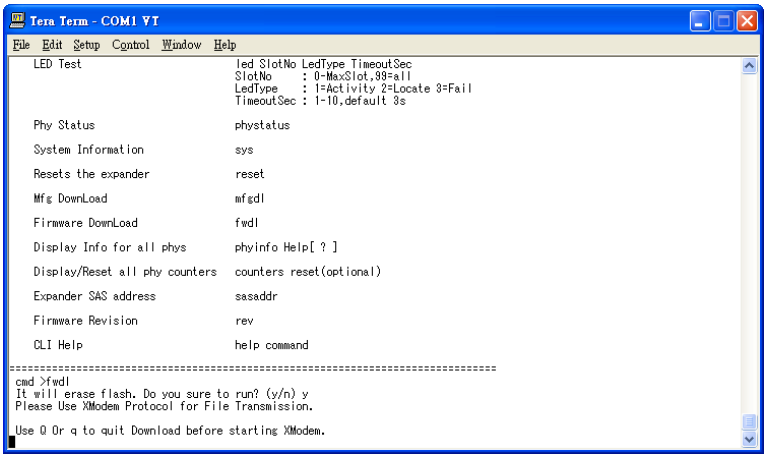
STEP6: Use command "**rev**" verify MFG and firmware version

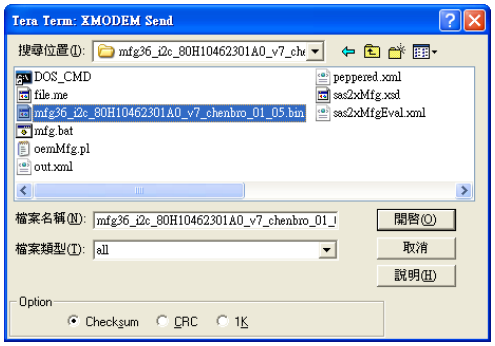



- **How to upgrade Firmware-MFG Image**

STEP1: Use command (**"mfgdl" and "y"**)

STEP2: Please use transfer --> XMODEM --> Send file, selection mfg code .bin

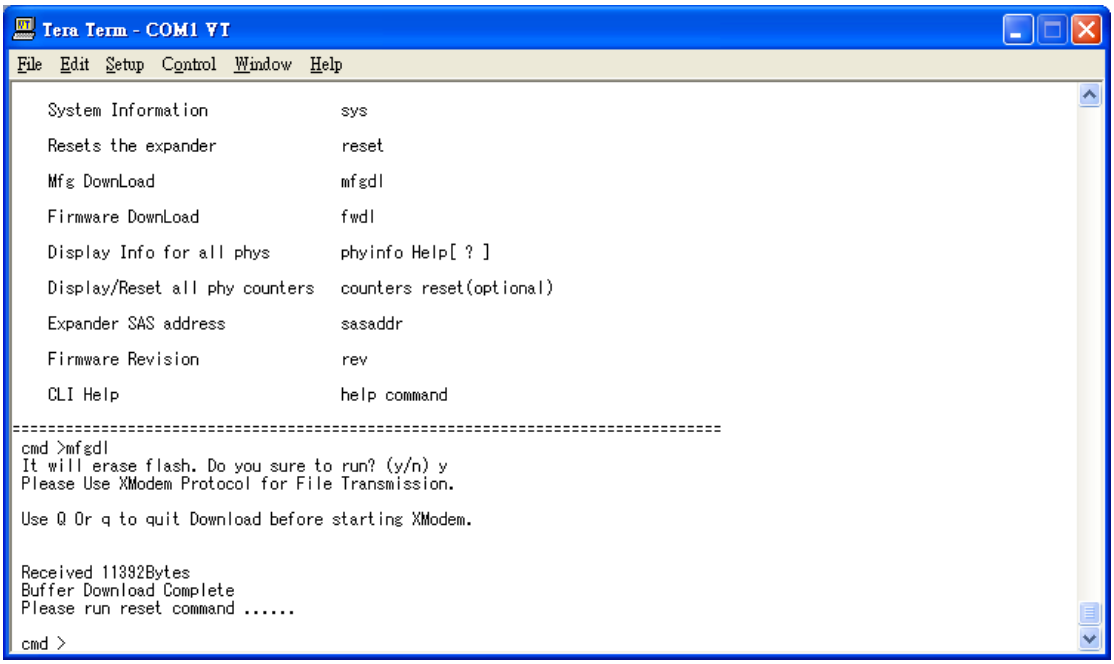



Ex: mfg36_i2c_**80H10462301A0**_v7_chenbro_01_05.bin

Please verify your SAS expander model & P/N, suitable hardware/software revision should be matched.

STEP3: Download mfg image file complete




STEP4: Use "**reset**" command reset expander system.

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